

Quick and Dirty RDF

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What is the Web?

- decentralized/distributed hypertext
- The Web is a system of Representational State Transfer (other systems may be RESTful too)
- a uniform set of operations over URIs (resource ids), which result in the transfer of resource representations

What is RDF?

- a formal model-theoretic semantics;
- used to making assertions about WR;
- an exchange syntax (XML) for publishing assertions as graphs;
- and: metadata; KR; interoperable DS; an OW assertional logic.

RDF Terminology

- “Resource Description Framework”
- KR for the Web: [hyperkrep!](#)
- Triple: (subject, predicate, object)
 - UIB, U, UIB/(PlainLit|TypedLit)
- RDF model: {T}
- Statement or assertion

- knowledge base (“the kb”)
- Formal semantics based on “model theory”, which allows formal inferencing and other reasoning services
- RDFS: declare classes, subclasses, properties, subproperties, domain/range restrictions

RDF Applications

- 📌 RSS 1.0
- 📌 FOAF
- 📌 Annotea
- 📌 CC/PP, P3P, Device Independence
- 📌 Semantic Web, Web Services, SemWS

Tickling the Triple

- Subject: URI (URIRef: U#foo)
- Predicate: URI
- Object: URI, Plain literal, Typed literal (Schema), XML literal
- bnode (“blank node”) -- anonymous node (a graph local existential var)

Exchanging KnowLedge

- 📌 RDF graph data model, with standardized XML serialization: RDF/XML
- 📌 Other serialization types: N3, N-Triples, Turtle, RXR, TRiX
- 📌 All serialize -- more or less -- the same model, same data structure

Querying Knowledge

- At least 4 families of RDF query languages: rules (N3, psychinko, cwm, Euler), path-like (TreeHugger, Versa, etc.), SQL-like (RDQL, now: **SPARQL!**), logical (RQL, SeRQL)
- Inferencing or not

Managing KnowLedge

- Rule, validation, and constraint systems (Schemarama, Psychinkatron)
- OWL and RDFS (computationally tractable fragments of FOPL) -- these aren't really data validation languages
- Typed and XML literals

Accessing KnowLedge

- 📌 SPARQL Protocol, Joseki, DIG, TAP
- 📌 Triple Stores:
 - 📌 Kowari(.sf.net)... Alas, no TKS
 - 📌 Redland, rdflib, 3Store

RDF/XML Sucks!

But It Doesn't Matter

- 📌 It can be hard to see the triples
- 📌 Should be used as an exchange language only
- 📌 Programmers interact with triple store APIs or with XML result set formats
- 📌 Lotsa alternatives

Advanced Stuff

- Reification: `rdf:Statement`, `rdf:subject`, `rdf:predicate`, `rdf:object`
-- T fecund!
- uncloseable containers (`bag`, `seq`, `alt`) & closeable collections (`list`, `first`, `rest`, `nil`)
- inferencing: RDFS entailments
- datatypes: value space, lexical space, $l \rightarrow v$ mapping
- multiple arity predicates

Whither XML?

- Why not?
 - Syntactic interop only
 - No generic semantics
 - Greenspun's Law?
 - OWA v. CWA
 - Ad hoc, bottom up schema evolution
- Why? More tools, hackers, familiarity